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English Translation of FR1281684

PATENT NUMBER 1,281,684

Cage for a roller bearing and in particular for a needle bearing

The present invention relates to a cage for a roller bearing and in particular for a needle bearing.

Cages for roller bearings and in particular for needle bearings are known, these cages being of the most diverse types, such as cages made from sheet metal or from high-mass metal or cages in one piece or in a plurality of pieces. One type often used is a cage, known as a housing, composed of two similar parts arranged one opposite the other and having apertures for guiding and holding the rollers and also two wings. Since, in a housing, these shells of U-shaped cross section are inserted one into the other to form a cage by being connected, the wings located on the outside are in each case bordered over a sufficient length to ensure that they firmly connect one of the shells to the other, whereas the wings located on the inside come into abutment against the bottom or core of the opposite shell and define the mutual distance between the two parts of the cage.

The apertures, the design of which is adapted to the shape of the rollers in order to guide and hold these, are produced in a width which is less than the diameter of the needles as a function of the thickness of the shells. To ensure that the rollers are held and guided and to have as small a width of the apertures as possible, the two shells of the cage must have a relatively large mutual spacing, thus resulting in a slight clearance of the cage with respect to the corresponding rolling tracks. This slight clearance and the wall thickness, which may be of the order of 1/5 of the diameter of the rollers, may lead to inopportune rolling in the region of the arms of the cage and

consequently to a jamming or inoperability of the bearings.

The task set for the present invention was to compensate this safety fault in cages for roller bearings and in particular for needle bearings, composed of two shells of U-shaped cross section which are inserted with their wings one into the other and fastened to one another and which have cut-out apertures for guiding and holding the rollers, the mutual spacing of the two shells being defined by the inner wings, the improvement being obtained by the formation, in the two shells, of indentations which take the form of flutes or of grooves extending over the entire periphery or over the entire length of the cage.

The invention makes it possible, in complete safety, to avoid the abovementioned disadvantages of the known cages; the rolling of the rollers in the region of the arms of the cage and all the consequences which may arise as a result of this are made impossible.

The invention assumes, furthermore, that the indentations of the two shells are arranged so as to come into mutual contact. However, it also allows these indentations of the two shells to be capable of being arranged so as to form a gap between them.

It is indicated that the indentations are arranged within the middle part of the webs of the U-profiles. However, still according to the invention, indentations may also be arranged in the vicinity of the two wings.

According to another embodiment of the invention, flutes or grooves running over the entire periphery or over the entire length of the cage are executed with the same depth in the two shells.

Still according to the invention, the said flutes or grooves may also be executed with different depths in the two shells.

The accompanying drawings illustrate various exemplary embodiments, namely:

Fig. 1 a plan view of a needle-type axial cage with flutes in the form of circles;

Fig. 2 a section along the line II-II of Fig. 1, but on a larger scale;

Fig. 3 a section through a cage for plane guides;

Fig. 4 a partial plan view of the cage of Fig. 3;

Fig. 5 a longitudinal section along the line V-V of Fig. 4;

Fig. 6 a longitudinal section through a radial needle-type cage on a larger scale;

Fig. 7 a section along the line VII-VII of Fig. 6.

The axial needle-type cage illustrated in Fig. 1 shows the needles 1 in the apertures 2 between the two shells of U-shaped cross section 3 and 4. In each of these two shells is provided a flute of circular shape 5. The special embodiment of this cage may be gathered on a larger scale from Fig. 2. The inner shell 3 possesses internally and externally, as does the outer shell 4, moreover, wings directed in the direction of the axis, 6 and 7, on the one hand, and 8 and 9, on the other hand, in such a way that these two half-shells are inserted one into the other so as to form a housing. Each of the two shells is indented according to a circular flute 5, the depth of which is at most equal to half the mutual distance between the two shells 3

and 4. In the embodiment illustrated, the two indentations 5 are of a depth such that they come into contact with one another. The distance between the two shells 3 and 4 is defined by the length of the two wings 6 and 7, and their mutual connection is immobilized along the flanks 8 and 9. By means of the two flutes 5, not only is any risk of rolling in the region of the arms 10 separating the apertures 2 prevented, but at the same time a guidance of the needles 1 in their middle part is obtained.

Fig. 3 illustrates two bands, one internal 11 and the other external 12, of U-shaped profile, which are connected to form a plane guide cage intended for receiving rollers 14 in the apertures 13 (see Figs. 4 and 5). Each of the two bands has two flutes 15 and 16, on the one hand, and 17 and 18, on the other hand, the depth of which is smaller than half the mutual distance between the two bands 11 and 12, which is once again defined by the length of the two wings 19 and 20, whilst the mutual connection of the two bands is carried out along the two wings 21 and 22. By means of the two wings 19 and 20, on one side, and 21 and 22, on the other side, the two profiled bands are held in the direction of the axis of the bearing. Moreover, the indentations 15, 16, 17 and 18 are designed in such a way that a spacing exists between any two of them opposite one another.

It can be seen in Figs. 4 and 5 that the rollers 14 are held by means of cut-out apertures of non-uniform width. The distance between the roller 14 and the edge 23 of the middle part of the cut-out aperture 13, of lesser width than the diameter of the roller, is equal to the distance between the roller 14 and the edge 24 of the flute formed, by virtue of which the roller is guided simultaneously both by the edge 23 and the edge 24. Whereas, in the case of a plane guide cage resting on the rolling track of the rollers, rolling in the

region of the arms 10 may occur, this possibility is avoided absolutely by means of the flutes produced.

The radial needle-type cage illustrated on a larger scale in Fig. 6 is composed of an internal part 25 and of an external part 26. These two parts of U-shaped cross section have wings directed in the radial direction 27 and 28, on the one hand, and 29 and 30, on the other hand. The longitudinal parts 31 and 32 oriented in the direction of the axis between these wings are provided with flutes in the form of arcs of a circle 33 and 34, on the one hand, and 35 and 36, on the other hand. The depth of the flutes 33 and 34 of the internal part 25 goes as far as the mid-circle of the needles 37, whilst the depth of the flutes 35 and 36 of the external part 26 is relatively small. Since the risk of inopportune rolling in radial needle-type cages composed of two parts of the type illustrated is greater in the region of the longitudinal ribs 31 of the internal part, the flutes 33 and 34 of the latter are made deeper than the flutes 35 and 36 of the external part. The distance between the needles 37 and the edges 38 of the flutes 33 and 34 of the internal part 25, on the one hand, and the edges 39 of the flutes 35 or 36 of the external part 26, on the other hand, is smaller than the distance from the edges 40 of the longitudinal parts 31 and the edges 41 of the parts 32. As a result, the needles 37 are guided along the edges 38 and 39, whilst the edges 40 and 41 only hold the needles.

Claims

1. Cage for a roller bearing and in particular for a needle bearing, composed of two shells of U-shaped cross section which are inserted with their wings one into the other and fastened to one another and which have cut-out apertures for guiding and holding the rollers, the mutual spacing of the two shells being defined by the inner wings, this cage being characterized in that it possesses, in the two shells, indentations which are in the form of flutes or of grooves arranged over the entire periphery or over the entire length of the cage.

2. Cage according to Claim 1, possessing the following points separately or in combinations:

a. the indentations of the two shells of the cage are formed so as to come into mutual contact;

b. the indentations of the two shells of the cage are arranged so as to form a gap between them;

c. the indentations are arranged in the middle part of the webs of the U-profiles;

d. the indentations are arranged in the vicinity of the two wings;

e. the depth of the flutes or grooves running over the entire periphery or over the entire length of the cage is the same in the two shells;

f. the depth of the said flutes or grooves is different in the two shells.

Fig. 1

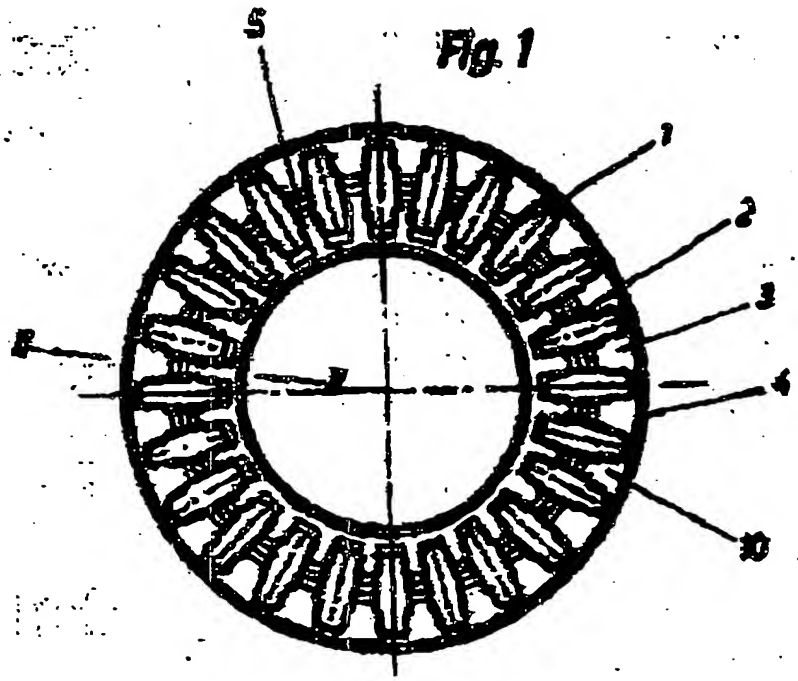


Fig. 2

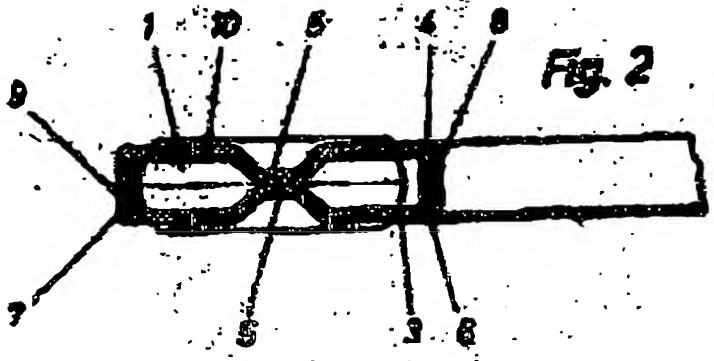


Fig.3

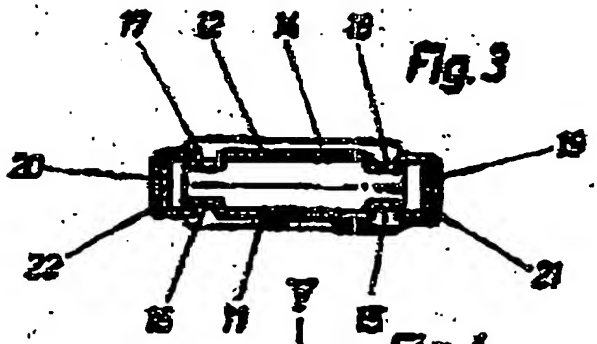


Fig.4

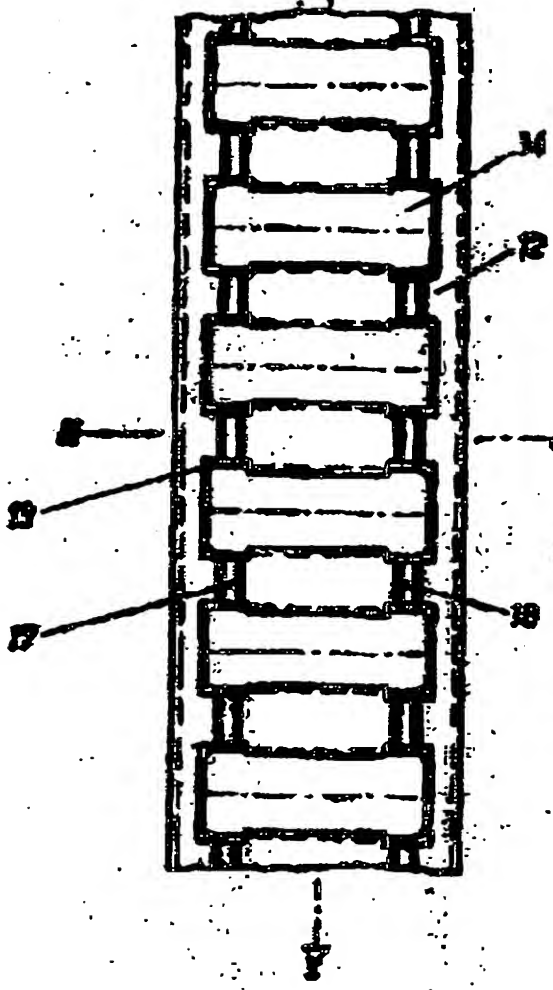
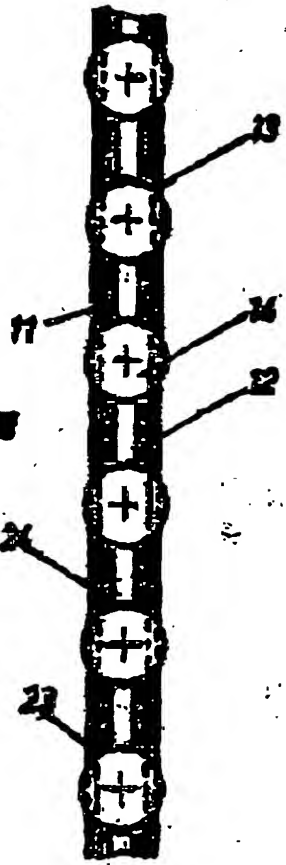


Fig.5



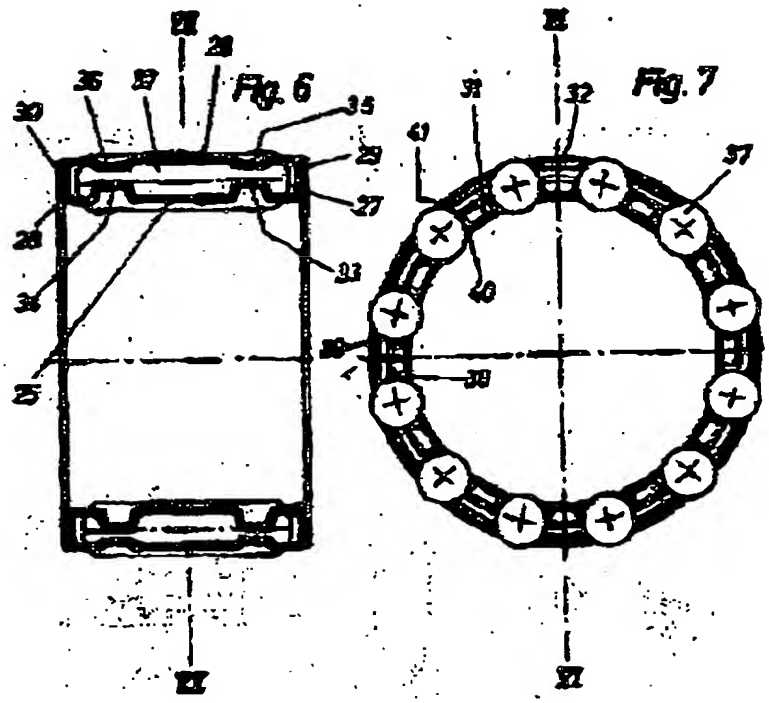


Fig. 6
Fig. 7